

# United States Patent [19]

Smallwood et al.

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## [54] GAS DISCHARGE LAMP AND POWER DISTRIBUTION SYSTEM THEREFOR

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### Related U.S. Application Data

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[51] Int. Cl.<sup>6</sup> ..... H01J 7/44

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[58] Field of Search ..... 315/58, 56, 57, 315/50, 105; 362/224, 221, 217, 260

### [56] References Cited

#### U.S. PATENT DOCUMENTS

4,293,799 10/1981 Roberts ..... 315/256

5,208,511 5/1993 Garbowicz ..... 315/106

5,294,865 3/1994 Haradon ..... 315/58

5,485,057 1/1996 Smallwood et al. .... 315/58

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### [57] ABSTRACT

Fluorescent type lamps are arranged to have high frequency power derived from standard, commercial A.C. sources either directly or from power levels distributed from a master ballast. When the master ballast is employed, it functions as an interface between the primary power source and a distribution network to one or more modules so as to relieve the modules of operations such as initial power form conversions, filtering and power factor correcting which require large components. The module or modules driven by the master ballast output are contained within the lamp envelope or attached as an extension of the lamp envelope. The module is formed of elements mounted as a miniaturized unit configured to fit within the lamp envelope or to attach to the end of the envelope. The module includes oscillator components mounted on an elongated board so as to form an assembly with a cross-section compatible with the perimeter of the envelope itself. The module can operate independent of a master ballast unit by including power handling circuitry within the module.

6 Claims, 7 Drawing Sheets

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